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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09/806,309      | 07/06/2001  | Hidehiko Funaoka     | 010311              | 6699             |

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EXAMINER

CHANG, VICTOR S

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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1771

DATE MAILED: 08/26/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/806,309

Applicant(s)

FUNAOKA ET AL.

Examiner

Victor S Chang

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-29 is/are pending in the application.
- 4a) Of the above claim(s) 11-26 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10, 27-29 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Restriction is required under 35 U.S.C. 121 and 372.

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1.

In accordance with 37 CFR 1.499, applicant is required, in reply to this action, to elect a single invention to which the claims must be restricted.

Group I, claims 1-10 and 27-29, drawn to a microporous polyolefin membrane and its uses as battery separator and filter (428/304.4).

Group II, claims 11-26, drawn to a method of producing a microporous polyolefin membrane (264/41).

2. The inventions listed as Groups I and II do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The special technical feature of Group II including a solvent as processing aid, this feature is not present in Group I. Thus, unity of invention is lacking between Group I and Group II.

3. During a telephone conversation with Stephen Adrian on 8/9/02 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-10 and 27-29. Affirmation of this election must be made by applicant in replying to this Office action. Claims 11-26 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

4. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

### ***Specification***

5. Applicant is reminded of the proper language and format for an abstract of the disclosure.

The abstract should be in narrative form and generally limited to a single paragraph on a separate sheet within the range of 50 to 150 words. It is important that the abstract not exceed 150 words in length since the space provided for the abstract on the computer tape used by the printer is limited. The form and legal phraseology often used in patent claims, such as "means" and "said," should be avoided. The abstract should describe the disclosure sufficiently to assist readers in deciding whether there is a need for consulting the full patent text for details.

The language should be clear and concise and should not repeat information given in the title. It should avoid using phrases which can be implied, such as, "The disclosure concerns," "The disclosure defined by this invention," "The disclosure describes," etc.

### ***Claim Rejections - 35 USC § 112***

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 1-10 and 27-29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The claims are generally narrative and indefinite, failing to conform with current U.S. practice. They appear to be a literal translation into English from a foreign document and are replete with grammatical and idiomatic errors, multiple translation and foreign practice informalities. Examples include:

In claim 1, line 1, the phrase "composed of" should be rewritten as --comprising--

In claim 1, line 3, it is not clear what "this polyolefin" encompasses.

In claim 1, line 7, it is not clear to the Examiner which lamellas are included in "the section cut in the mechanical direction".

In claims 27-29, the phrase "which uses" is considered to be informal, vague and indefinite.

### ***Claim Rejections - 35 USC § 103***

8. Claims 1-2, 7, 9-10, and 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kono et al. (US 4588633).

Kono's invention is directed to a thin high strength microporous membrane of ultrahigh molecular weight polyethylene (column 1, lines 7-8). The polyethylene used is a crystalline polyethylene of ultrahigh molecular weight, consisting of homopolymer of ethylene or a copolymer of ethylene. The weight average molecular weight should be at least  $5 \times 10^5$ , and preferably  $1 \times 10^6$  to  $10 \times 10^6$  (column 2, lines 34-39). Kono also teaches that a mean pore diameter of 0.1 to 4  $\mu\text{m}$  is obtained (column 4, lines 28-29). Further, Kono teaches that the porous materials have been used for various applications, e.g., separators for cells, various filters, etc. (column 1, lines 14-16).

Although Kono does not state the orientation of the lamella crystals and the membrane orientation function by X-ray analysis, it is noticed that the method of making the membrane by gel sheet process in the instant claimed invention is essentially the same as Kono's invention, and the Examiner takes Official notice that the orientation of the lamella crystals and membrane orientation function are either inherent physical properties of the membrane made by gel sheet process, or obvious optimizations to one of ordinary skill in the art, motivated by the desire to optimize the mechanical strength of the microporous membrane, e.g., in the thickness direction.

9. Claims 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kono et al. (US 4588633) either individually, or in view of Takita et al. (US 5051183).

The teachings of Kono are again relied upon as set forth above.

For claims 3-6, Kono does not teach that the polyolefin is a blend of polyolefin with different molecular weights and its molecular weight distribution, which the Examiner believes is within the skill of the art. Alternatively, Takita '183 is related to a microporous polyolefin membrane made of a polyolefin composition containing 1 weight % or more of an ultra-high-molecular-weight polyolefin having a weight-average molecular weight of  $7 \times 10^5$  or more and having a weight-average molecular weight/number-average molecular weight ratio of 10-300 (Abstract). As such, it would have been obvious to one of ordinary skill in the art to modify Kono's microporous membrane with a blend of different ultra high molecular weight polyolefins, and with a molecular weight distribution of 10-300, as taught by Takita '183, motivated by the desire to improve the membrane mechanical properties, such as the stretchability.

10. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kono et al. (US 4588633) in view of Takita et al. (US 5922492).

The teachings of Kono are again relied upon as set forth above.

For claim 8, Kono does not teach that the polyolefin composition comprises a low density polyethylene having shut-down property. Takita '492 is directed to a microporous polyolefin composite membrane. Takita '492 teaches that an optional shut-down polymer is a low molecular weight polyethylene (LMWPE), preferably having Mw of 1000 to 4000 and a melting point of 80 to 130°C (column 4, lines 20-35). As such, in the absence of unexpected results, it would have been obvious to one of ordinary skill in the art to include the optional shut-down polyolefin of Takita '492 in Kono's microporous membrane, motivated by the desire to provide additional safety feature to the membrane.

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. In addition, the following references are cited of interest for making microporous membrane:

US 4873034 to Kono et al.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Victor S Chang whose telephone number is 703-605-4296. The examiner can normally be reached on 8:30 - 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrel H Morris can be reached on 703-308-2414. The fax phone numbers

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for the organization where this application or proceeding is assigned are 703-872-9310 for regular communications and 703-872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.

VSC  
August 21, 2002

DANIEL ZIRKER  
PRIMARY EXAMINER  
GROUP 1900-  
1700

*Daniel Zinker*